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MINERALS PROGRAM
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October 2, 1989

Holland Sheppard
Utah Division of Oil, Gas & Mining
355 West North Temple
Salt Lake City, Utah 84180-1203

RE: **Pine Canyon Water Quality Data**

Dear Holland:

This letter is in response to our telephone conversation on August 25, 1989, during which you raised the following questions:

1. From exactly what location were the water quality samples collected that are included as Appendix 1 in the "Pine Canyon Final Reclamation Plan "prepared by JBR Consultants?

2. What are Kennecott's plans for future ground and surface water quality monitoring in Pine Canyon?

To answer the first question, the analyses include as Appendix 1 in the JBR Report are from samples collected from the Pine Canyon Portal. During my inquiry on this matter, I discovered that there were other water quality samples that were collected during the same sampling event but were inadvertently left out of the report. The results of these analyses are attached. For clarification the locations of these sampling sites are as follows:

Big Springs: sampled at the weir on the downstream side of the spring-fed trout pond in the lower section of Pine Canyon.

Adamson Tunnel: sampled from a pipe that flows into the large water tank in the lower section of Pine Canyon.

Pine Canyon Tunnel: samples collected from the portal located up-canyon from the large head-frame and service shaft.

Car Fork Wells
#1, 2 and 4: ground-water samples collected from three out of four existing supply wells in the lower section of Pine Canyon. No sample was collected from well #3 due to an inoperable pump.

In response to your second question, Kennecott is preparing to collect a second round of water samples from the same six sources listed above so that a consistent water quality data base can be established for Pine Canyon. Furthermore, Kennecott has asked JBR Consultants to review the suitability of existing wells to monitor ground-water quality in the area and to propose locations that may be appropriate for additional monitor wells, if warranted. As plans on this issue are firmed, I will inform you accordingly.

I hope that I have sufficiently addressed your questions and trust that the information I have included will be of use to you. Please don't hesitate to call me at 569-6640 if you have any questions.

Sincerely,

Fred R. Snyder

Fred R. Snyder
Senior Hydrogeologist

FRS/avc

PINE CANYON GROUND-WATER QUALITY DATA

September 1988

	CARR FORK WELL #1		CARR FORK WELL #2		CARR FORK WELL #4	
Parameter	Total	Dissolved	Total	Dissolved	Total	Dissolved
PH	7.65		7.5			7.7
TEMP	11		11			13
COND	455		452		471	
CO3	5		5		5	
HC03	203		212		209	
TDS	409		338		343	
S04	73		74		79	
CL	20		16		21	
CA	52		49		54	
NA	27.3		28		27.4	
MG	26.6		24.7		27	
K	1.1		1.4		2.4	
CU	0.02	0.02	0.03	0.01	0.03	0.01
FE	0.58	0.03	1.17	0.02	0.23	0.05
AS	0.008	0.008	0.005	0.005	0.007	0.004
MN	0.03	0.02	0.04	0.04	0.05	0.04
ZN	0.11	0.03	0.06	0.02	0.10	0.07
AL	0.1	0.1	0.1	0.1	0.1	0.1
PB	0.005	0.005	0.005	0.005	0.005	0.005
SE	0.012	0.012	0.006	0.004	0.007	0.004
NI	0.02	0.02	0.01	0.01	0.01	0.01

Pine Canyon Ground-Water Quality Data
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	CARR FORK WELL #1		CARR FORK WELL #2		CARR FORK WELL #4	
Parameter	Total	Dissolved	Total	Dissolved	Total	Dissolved
BA	0.08	0.07	0.08	0.07	0.07	0.05
CD	0.005	0.005	0.005	0.005	0.005	0.005
CR	0.07	0.03	0.07	0.01	0.02	0.01
AG - Silver	0.01	0.01	0.05	0.01	0.01	0.01
HG - Mercury	0.0001		0.0001		0.0001	
BE	0.004	0.004	0.004	0.004	0.004	0.004
? - PHOH	.01		.01		.01	
MPN-T	1					
fecals? & coliforms? MPN-F	1					
NO3-N	1.4		1.3		1.4	
NO2-N	.05		.05		.05	

units ?

PINE CANYON SURFACE WATER QUALITY DATA

September 1988

	BIG SPRING		ADAMSON TUNNEL		PINE CANYON TUNNEL	
Parameter	Total	Dissolved	Total	Dissolved	Total	Dissolved
PH	7.7		7.6		8.4	
TEMP	14		14		13	
COND	500		463		484	
CO3	5		5		5	
HC03	183		212		194	
TDS	354		337		373	
S04	90		75		118	
CL	31		21		10	
CA	57		54		65	
NA	21.7		23		17.7	
MG	28		28.2		32.7	
K	2.6		2.6		2.3	
CU	0.03	0.01	0.05	0.01	1.13	0.01
FE	0.47	0.03	0.09	0.01	0.42	0.03
AS	0.025	0.005	0.006	0.006	1.23	0.011
MN	0.03	0.02	0.04	0.04	0.03	0.02
ZN	0.05	0.01	0.05	0.01	0.23	0.01
AL	0.1	0.1	0.1	0.1	0.1	0.1
PB	0.005	0.005	0.005	0.005	0.249	0.005
SE	0.006	0.006	0.007	0.007	0.008	0.006
NI	0.01	0.01	0.02	0.01	0.01	0.01

1.13 ppm = 1.13 mg/l = 1130 ug/l

Pine Canyon Surface Water Quality Data
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	BIG SPRING		ADAMSON TUNNEL		PINE CANYON TUNNEL	
Parameter	Total	Dissolved	Total	Dissolved	Total	Dissolved
BA	0.05	0.07	0.07	0.03	0.02	0.02
CD	0.005	0.005	0.005	0.005	0.015	0.005
CR	0.02	0.01	0.02	0.01	0.02	0.01
AG	0.01	0.01	0.01	0.01	0.01	0.01
HG	0.0001		0.0001		0.0001	
BE	0.004	0.004	0.004	0.004	0.004	0.004
PHOH	.01		.01		.01	
MPN-T						
MPN-F						
N03-N	1.3		1.4		.2	
N02-N	.05		.05		.05	